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UV curabl scratch resistant coatings for thermoplastics - contg.
 polyunsaturat d monomer and a photoinitiator, with heating during
 irradiati n to improve adhesion

Scratch-resistant coatings are applied to thermoplastic and
 thermoelastic substrates by applying a UV-curable compsn.
 comprising a radical polymerisable monomer with at least
 two polymerisable C-C double bonds (alone or mixed with
 other monomers contg. polymerisable double bonds with a
 b.pt. above the curing temp.) and a photoinitiator, and cur-
 ing the coating by means of UV radiation at a temp. between
 70 deg.C and the Tg of the plastic.

USE/ADVANTAGES

The process is esp. useful for applying scratch-resistant
 coatings to polystyrene, rigid PVC, HIPS, polycarbonates,
 acrylic resins, etc., and esp. to PMMA and polycarbonate
 glass. Curing the coating at elevated temp. gives coating
 films with improved adhesion to the substrate.

DETAIL

The coatings are e.g. 2-30 micrometres thick and are
 cured by UV radiation at 70-150, esp. 80-130 deg.C. Curing

is carried out e.g. with UV radiation at 250-400 nm wave-
 length for at most 20 sec. The coating may be applied e.g.
 to extruded sheet or film 20 micrometres to 8 mm thick
 e.g. of polycarbonate or acrylic polymers contg. at least
 60% Me methacrylate. Coating is carried out e.g. immedi-
 ately after extrusion, pref. under a low-oxygen or oxyg n-
 free atmos.

Typical monomers are acrylic esters of two- or more
 hydric alcohols such as glycerin, trimethylolpropane,
 pentaerythritol, 1,2,4-butanetriol, etc., opt. mixed with
 other monomers contg. 1 or 2 double bonds such as
 (di)ethyleneglycol di(meth)acrylate, propyleneglycol
 di(meth)acrylate, (meth)acrylonitrile, styrene, etc.

Typical photoinitiators are benzoin, 2-methylbenzoin,
 benzil, benzophenone, etc.

EXAMPLE

A polymethylmethacrylate sheet at 90 deg.C was coated
 with a compsn. comprising (by wt.) 75 pts. trimethylolpro-
 panetriacrylate, 20 pts. pentaerythritol tetraacrylate and
 5 pts. wt. benzoin isobutylether, and cured with a Hg lamp
 for 30 sec. The coating had excellent adhesion and scratch
 resistance.(13pp513)

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